

University of INSA Lyon



IST-4-DBM1
Telecommunications Department
Databases Part 1

Group Project:
Video Game Market

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Example report
<https://www.scribd.com/document/227783173/Database-Project-Report>
Dataset
<https://www.kaggle.com/datasets/gregorut/videogamesales>

Relational Algebra

Queries for Database to be done in Relational Algebra

- How many games were released in 2016?
- Group the Games from Highest Selling
- What region accounts for the majority of sales?
- List the games released by Activision
- List the games released for the Wii Platform
- Find the average number of sales of games released in North America
- List all the games that sold more than 10 million copies

Answers in PostGre

Q1 ANS

$\Pi_{\text{COUNT}(\text{release_year})}$
 $\gamma_{\text{COUNT}(\text{release_year})}$
 $\sigma_{\text{release_year} = 2016} \text{ game_pl}$

Q2 ANS

$\tau_{\text{SUM}(\text{num_sales}) \downarrow}$
 $\pi_{g.\text{game_name}, pl.\text{platform_name}, gp.\text{release_year}, pub.\text{publisher_name}, \text{SUM}(\text{num_sales}) \rightarrow \text{global_sales}}$
 $\gamma_{\text{game_name}, \text{platform_name}, \text{release_year}, \text{publisher_name}, \text{SUM}(\text{num_sales})}$
 $(\rho_{rs} \text{ regional_sales} \bowtie_{rs.\text{region_id} = r.\text{id}}$
 $\rho_r \text{ region} \bowtie_{rs.\text{game_platform_id} = gp.\text{id}}$
 $\rho_{gp} \text{ game_pl} \bowtie_{gp.\text{game_publisher_id} = gpub.\text{id}}$
 $\rho_{gpub} \text{ game_publisher} \bowtie_{gpub.\text{game_id} = g.\text{id}}$
 $\rho_g \text{ games} \bowtie_{gp.\text{platform_id} = pl.\text{id}}$
 $\rho_{pl} \text{ platform} \bowtie_{gpub.\text{publisher_id} = pub.\text{id}}$
 $\rho_{pub} \text{ publisher})$

Q3 ANS

$\pi_{\text{SUM}(\text{num_sales}) \rightarrow \text{north_america_sales}}$
 $\gamma_{\text{SUM}(\text{num_sales})}$
 $\sigma_{\text{region_id} = 1}$
 $(\rho_{rs} \text{ regional_sales} \bowtie_{rs.\text{region_id} = r.\text{id}}$
 $\rho_r \text{ region})$

Q4 ANS

$\pi_{g.\text{game_name}, pl.\text{platform_name}, gp.\text{release_year}, pub.\text{publisher_name}, \text{SUM}(\text{num_sales}) \rightarrow \text{global_sales}}$
 $\gamma_{\text{game_name}, \text{platform_name}, \text{release_year}, \text{publisher_name}, \text{SUM}(\text{num_sales})}$

$$\begin{aligned}
& \sigma_{\text{publisher_name} = \text{"Activision"}} \\
& (\rho_{rs} \text{ regional_sales} \bowtie_{rs.region_id = r.id} \\
& \rho_r \text{ region} \bowtie_{rs.game_platform_id = gp.id} \\
& \rho_{gp} \text{ game_pl} \bowtie_{gp.game_publisher_id = gpub.id} \\
& \rho_{gpub} \text{ game_publisher} \bowtie_{gpub.game_id = g.id} \\
& \rho_g \text{ games} \bowtie_{gp.platform_id = pl.id} \\
& \rho_{pl} \text{ platform} \bowtie_{gpub.publisher_id = pub.id} \\
& \rho_{pub} \text{ publisher})
\end{aligned}$$

Q5 ANS

$$\begin{aligned}
& \pi_{g.game_name, pl.platform_name, gp.release_year, pub.publisher_name, SUM(num_sales) \rightarrow global_sales} \\
& \gamma_{game_name, platform_name, release_year, publisher_name, SUM(num_sales)} \\
& \sigma_{platform_name = \text{"Wii"}} \\
& (\rho_{rs} \text{ regional_sales} \bowtie_{rs.region_id = r.id} \\
& \rho_r \text{ region} \bowtie_{rs.game_platform_id = gp.id} \\
& \rho_{gp} \text{ game_pl} \bowtie_{gp.game_publisher_id = gpub.id} \\
& \rho_{gpub} \text{ game_publisher} \bowtie_{gpub.game_id = g.id} \\
& \rho_g \text{ games} \bowtie_{gp.platform_id = pl.id} \\
& \rho_{pl} \text{ platform} \bowtie_{gpub.publisher_id = pub.id} \\
& \rho_{pub} \text{ publisher})
\end{aligned}$$

Q6 ANS

$$\begin{aligned}
& \pi_{AVG(num_sales) \rightarrow north_america_avg} \\
& \gamma_{AVG(num_sales)} \\
& \sigma_{region_id = 1} \\
& \rho_{rs} \text{ regional_sales}
\end{aligned}$$

Q7 ANS

$$\begin{aligned}
& \pi_{g.game_name, pl.platform_name, gp.release_year, pub.publisher_name, SUM(num_sales) \rightarrow global_sales} \\
& \gamma_{game_name, platform_name, release_year, publisher_name, SUM(num_sales)} \\
& \sigma_{num_sales > 10} \\
& (\rho_{rs} \text{ regional_sales} \bowtie_{rs.region_id = r.id} \\
& \rho_r \text{ region} \bowtie_{rs.game_platform_id = gp.id} \\
& \rho_{gp} \text{ game_pl} \bowtie_{gp.game_publisher_id = gpub.id} \\
& \rho_{gpub} \text{ game_publisher} \bowtie_{gpub.game_id = g.id} \\
& \rho_g \text{ games} \bowtie_{gp.platform_id = pl.id} \\
& \rho_{pl} \text{ platform} \bowtie_{gpub.publisher_id = pub.id} \\
& \rho_{pub} \text{ publisher})
\end{aligned}$$